

REVIEWS

Rydberg's Flora of the Rocky Mountains *

It is remarkable that although all parts of the United States have been settled now for many years, and most of the states explored rather thoroughly, botanically, no flora of the whole country has ever been published, if we except the fragmentary works of such early writers as Michaux, Pursh, and Nuttall. Indeed, only two serious attempts at a United States flora have ever been initiated, that of Torrey and Gray, some eighty years ago, and the comparatively recent Synoptical Flora, begun by Dr. Gray—neither of these ever brought near completion. This lamentable lack has been partly compensated for by the numerous regional manuals and by a host of state floras, some of them descriptive. With the appearance of Dr. Rydberg's long-awaited Flora of the Rocky Mountains, the regions for which a more or less adequate published flora exists are so extended that only two states are left unprovided for—Nevada and Arizona.

Of the two floras of the Rocky Mountains previously published, the first, by Coulter, appeared in 1885, and has long been so out of date as to be useless. The second, by Coulter and Nelson, appeared in 1909; it is an admirable work, so far as Wyoming and the immediately adjacent regions are concerned, but it is less satisfactory for the more remote districts. The present work covers a much larger region than either of its predecessors, its area extending from Saskatchewan, western Nebraska, and Colorado to eastern British Columbia, Idaho, and Utah, and it will be found to cover satisfactorily eastern Washington and Oregon, as well as the mountains of northern New Mexico. Several states and provinces now for the first time have a descriptive flora available—Utah, Idaho, Saskatchewan, and Alberta.

*Flora of the Rocky Mountains and adjacent plains—Colorado, Utah, Wyoming, Idaho, Montana, Saskatchewan, Alberta, and neighboring parts of Nebraska, South Dakota, North Dakota, and British Columbia. By P. A. Rydberg, Ph.D., curator, New York Botanical Garden, pp. i-xii, 1-1110. New York, December, 1917. Published by the author.

Rydberg's Flora will well satisfy a botanical need that has become more acute in recent years with the rapid development of the montane states. Only those who have occasion to determine large collections of plants from this region, especially the marginal portions, where nomenclature and taxonomy have been a matter of accident rather than science, can fully appreciate its value. The Rocky Mountain area is a striking example of insularity in botanical work. Too often isolated individuals, actuated by the best of motives, but frequently without the assistance of adequate literature or herbaria, have carried forward their work independently of that done in other centers. Unwarranted importance has been assigned to geographic isolation as a factor in determining specific distribution, with the result that a given species has sometimes been described several times from separated localities. If this Flora were no more than a correlation of nomenclature it would still serve an invaluable purpose; but it is far more than a "nomenclator."

No botanist is so well qualified as Dr. Rydberg to prepare a manual of the Rocky Mountains. For twenty-five years the flora of this vast and varied region has been almost the sole subject of his study in herbarium and field. Although most of the work has been carried on at the New York Botanical Garden, all the larger herbaria and some of the smaller ones have been visited, and the author has obtained a field acquaintance with the plants through several seasons' botanizing in the most interesting regions. He has already published, besides numerous short systematic papers and a series dealing with phytogeography, two important works on Rocky Mountain botany, the Flora of Montana and the Yellowstone National Park (1900) and the Flora of Colorado (1906). The intimacy of his association with Rocky Mountain plants is indicated by the fact that in the present book almost a thousand species bear his name as author.

This latest manual is the first to give an adequate idea of the richness of the mountain flora. The species described number 5,897, distributed among 1,038 genera. The largest family, of course, is the Asteraceae, comprising 1,068 species, giving, with the Cichoriaceae and Ambrosiaceae, a total of 1,224 species of

composites, certainly a remarkably high percentage (20 per cent). The other large families are the Fabaceae (473), Poaceae (451), and Brassicaceae (325). Many of the genera are notable for the number of their representatives, especially *Poa* (67), *Carex* (162), *Salix* (76), *Eriogonum* (122), *Draba* (50), *Arabis* (50), *Potentilla* (80), *Lupinus* (80), *Pentstemon* (97), *Castilleja* (61), *Aster* (86), *Erigeron* (101), *Artemisia* (71), *Senecio* (114), and *Cirsium* (58).

Dr. Rydberg's ideas concerning species and genera are well known to the botanical public, and while there are many who will not agree with him in regard to the limits of groups, especially genera, such differences of opinion will not detract from the general usefulness of the flora. Synonyms are cited freely to coördinate generic segregations as well as variations in usage under different codes of nomenclature. If a botanical work is fairly and accurately written, the code of nomenclature followed and the measure of specific and generic limits adopted are matters of minor importance; and there is no doubt that the present work has been so prepared. Of special importance, too, is the fact that the descriptions have not been compiled but are drawn direct from the plants themselves.

The plan of the flora is excellent and in some respects superior to that of any similar American work. There are full keys to the families, genera, and species. The generic and specific descriptions are brief but adequate, and supplement the key characters. Too many descriptive floras, even the oldest and most thoroughly revised, might be decreased in bulk twenty-five per cent if superfluous descriptive phrases common to many species were omitted. Ranges are given concisely but with unusual fulness, accompanied by an indication of zonal distribution. Dates of flowering are included, as well as all essential synonymy. In spite of its large number of pages the book is of convenient size. Its typography is very pleasing, although unfortunately disfigured by an inordinate number of typographical errors, which, it would seem, could have been avoided.

Those who have attempted the preparation of similar botanical works understand the immense amount of labor, some of it drudgery unappreciated by the casual reader, which the com-

pletion of such a publication entails. A large part of an author's reward consists in his own sense of satisfaction at a task well done, but in this instance Dr. Rydberg will also receive the grateful appreciation of botanists, especially those of the West, for a volume that will be indispensable for many years, and will long stand as a monument to the industry, enthusiasm, and discriminating vision of its author.

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Two Connecticut forest reports*

The data for the first publication were gathered by traversing "every road" (?) in an automobile and plotting the forest areas on U. S. Geological Survey topographic maps. The length of time required is not clearly indicated, but except for three counties previously surveyed by other parties the field work seems to have begun in 1913 and ended in 1914.

About three pages are devoted to the three physiographic provinces: western upland, central lowland (Triassic), and eastern upland. There are about two pages on forest types (ten in number), 15 pages on forest conditions by counties, 3 pages on destructive influences (fungi, insects and fire), and about 2 pages of interesting historical notes. Then follow tables giving the actual and relative wooded area of each county and town. One of the maps shows by seven different shadings the approximate percentage of forest in each town, and the other the general location of the larger forest areas; both of which should be useful to botanists planning field work in Connecticut. The wooded area by counties ranges from 31 per cent in Fairfield County to 56 per cent in Tolland, and by towns from 5 per cent in Hartford to 88 per cent in Voluntown. The percentage for the whole state is 46.4. (No estimates of the forest area at earlier periods are given, but the reviewer has recently estimated from census figures that Connecticut had more woodland in 1910 than in 1790).† In 1893 the U. S. Geological Survey, in coöperation

* Moss, Albert E. A forest survey of Connecticut. Rep. Conn. Agric. Exp. Sta. 39: 197-230. 2 maps. New Haven, 1916.

_____. A forest survey of the town of Redding, Conn. Rep. Conn. Agric. Exp. Sta. 40: 383-427. New Haven, 1917.

† See the current (April) number of the Journal of Forestry (Washington, D. C.)